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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/822,440 | CHOI ET AL. | |
| | Examiner | Art Unit | |
| | Andrew T. Piziali | 1798 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *03 January 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/3/2011 has been entered.

### Prosecution History and Declarations

2. Beginning with the very first office action (mailed 5/23/2006), and up until the office action mailed 5/16/2008, the examiner cited Pierce as teaching a nonwoven filter material similar to that disclosed by the current specification but formed with a slurry pH of about 2.2 to about 3.2. The examiner also cited Dong to disclose that it is known in the wet laid nonwoven glass art to increase a slurry pH to within the range of about 5 to about 10.

In the very first response by applicant (filed 8/28/2006), and up until the appeal brief filed 4/28/2009, the applicant clearly and continuously asserted that although Dong taught a slurry pH of about 5 to about 10, Dong failed to teach or suggest a two-step pH adjustment of the fiber slurry (first lowering the pH and then raising the pH). Said assertion was the basis for applicant's continuously repeated argument that the applied prior art failed to teach or suggest a nonwoven web that inherently possesses the claimed gamma value. The applicant asserted that the pH of a fiber slurry had to be first lowered and then raised for the resulting nonwoven to

inherently possess the claimed gamma value. A glance at the file history clearly indicates that the applicant held this position up until the appeal brief. For example:

1) On pages 5 and 6 of the response filed 8/28/2006 the applicants asserted "The claimed Gamma value recited in claim 13 is obtained by forming a slurry having an acidic pH, and then adjusting the pH to a neutral or alkaline pH. The pH disclosed by Dong is merely the pH of the slurry. Dong does not suggest that the pH is ever adjusted. Accordingly, Dong fails to remedy the deficiencies of Pierce, and thus the combination of references does not teach a filter media that inherently has the claimed gamma value."

2) On page 2 of the response filed 11/13/2006 the applicants asserted "The specification makes it clear that the claimed gamma value, as well as the surface area and apparent density, are obtained as a direct result of adjusting the pH from an acidic pH to a neutral pH during the formation of the filter media."

3) On page 3 of the response filed 11/13/2006 the applicants asserted "Accordingly, the specification clearly shows that the claimed gamma value, surface area, and apparent density are a direct result of adjusting the pH of a slurry from an acidic pH to a neutral pH. Thus, in order for the cited references to inherently teach the claimed gamma value, surface area, and apparent density, the references must teach a filter media that is formed from a slurry of glass wool fibers having a pH that is adjusted from an acidic pH to a neutral pH."

4) On page 4 of the response filed 11/13/2006 the applicants asserted "As explained above, Applicant's specification makes it clear that the claimed Gamma value is obtained by forming a slurry having an acidic pH, and then adjusting the pH to a neutral or alkaline pH. Since Dong fails to teach or even suggest adjusting the pH, Dong fails to remedy the deficiencies of Pierce, and thus the combination of references does not teach a filter media that inherently has the claimed gamma value."

5) On page 1 of the response filed 3/7/2007 the applicants asserted "In a telephone interview with the Examiner on February 12, 2007, the Examiner agreed that a declaration showing that the claimed gamma value is a direct result of adjusting the pH of a slurry during formation of a filter media would be sufficient to overcome the pending rejections. Applicant therefore submits herewith a 1.132 Declaration of Wai Ming Choi. The declaration includes experimental data that shows that a filter media formed from a slurry without adjusting the pH does not have a gamma value of at least about 14, as compared to the data in Example 1 of the pending application which illustrates that adjusting the pH produces a filter media having a gamma value of at least about 14. The data in the attached Declaration, when compared to the date in Example 1 of the pending application, thus conclusively proves that adjusting the pH of the slurry is a direct result of the claimed gamma value. The references relied on by the Examiner to reject the pending claims therefore cannot inherently teach the claimed gamma value because they do not teach a filter media that is formed from a slurry of glass wool fibers having a pH that is adjusted from an acidic pH to a neutral pH."

6) In paragraph 5 of the declaration filed 3/7/2007 the inventor asserted "I unexpectedly discovered that adjusting the pH from an acidic pH to a neutral pH during formation of the filter media resulted in a filter media having a gamma value of at least about 14. In particular, the pH is adjusted by first adding an acidic agent to a slurry containing glass wool fibers, since glass wool fibers are anionic by nature. The acidic pH is then adjusted by adding a neutral or alkaline pH adjusting agent to the slurry to bring the pH to a range of about 6 to 12. I discovered that this additional step of adding a neutral or alkaline pH adjusting agent to the slurry unexpectedly produces a nonwoven glass web having improved filtration properties, and in particular having a gamma value of at least about 14."

7) **In paragraph 7 of the declaration filed 3/7/2007 the inventor asserted "The following Example A further proves that a gamma value of at least about 14 can only be obtained by adjusting the pH of the slurry first to an acidic pH, and then to a neutral or alkaline pH."**

8) On page 2 of the response filed 6/7/2007 the applicants asserted "Accordingly, Example 1 does in fact show that both steps (1) (adding an acidic adjusting agent) and (2) (adding a neutral or basic adjusting agent) mentioned above were performed, and thus the combination of steps is necessary to achieve the claimed gamma value."

9) On page 1 of the response filed 10/4/2007 the applicants asserted "Applicants specification clearly teaches, in paragraphs 0023 and 0024, that the gamma of 14 is obtained by first adding an acidic adjusting agent to the slurry, and then adding a neutral or alkaline pH adjusting agent, and thus the examples in the Supplemental Declaration are submitted to merely support this assertion."

10) In paragraph 5 of the declaration filed 10/4/2007 the inventor asserted "I unexpectedly discovered that adjusting the pH to an acidic pH, and then to a neutral pH during formation of the filter media resulted in a filter media having a gamma value of at least about 14, as explained in paragraphs 0023 and 0024 of the present application. In particular, the pH is adjusted by first adding an acidic agent to a slurry containing glass wool fibers, since glass wool fibers are anionic by nature. The acidic slurry is then adjusted by adding a neutral or alkaline pH adjusting agent to the slurry to bring the pH to a range of about 6 to 12. I discovered that this additional step of adding a neutral or alkaline pH adjusting agent to an acidic slurry unexpectedly produces a nonwoven glass web having improved filtration properties, and in particular having a gamma value of at least about 14."

11) **In paragraph 6 of the declaration filed 10/4/2007 the inventor asserted "The following examples prove that a gamma value of at least about 14 can only be obtained by performing two steps: (1) adjusting the pH of the slurry first to an acidic pH, and (2) then adjusting the pH to a neutral or alkaline pH."**

As shown above, the applicant not only filed office action responses that clearly asserted that a two-step pH adjustment was critical and essential to the invention, but the applicant also submitted multiple signed declarations clearly asserting that a two-step pH adjustment was critical and essential to the invention. The applicant even held multiple interviews with the examiner wherein the crux of the interviews was to convince the examiner that a two-step pH adjustment was critical and essential and not taught by the applied prior art. In response to said repeated assertion the examiner rejected the claims under 35 U.S.C. 112, first paragraph, as lacking said critical and essential feature. Inexplicably, in the appeal brief filed 4/28/2009, for

the first time, the applicant asserted that a two-step pH adjust adjustment is not necessary to obtain the claimed gamma value.

In the footnote on page 7 of the appeal brief the applicant asserts that previous arguments "admittedly appear to indicate that adjusting the pH is critical" but assures the court that this is not the case as allegedly evidenced by Example 2 of the application. The examiner respectfully disagrees. Firstly, said previous arguments do not simply "appear" to indicate that a two-step pH adjustment is critical. Rather, said arguments clearly admit that said pH adjustment is critical (see above). Secondly, regarding Example 2 of the specification, the applicant takes the position that the pH is never adjusted because pH adjusting agents are not explicitly mentioned in the Example. The examiner respectfully disagrees. Although Example 2 does not explicitly state the inclusion of pH adjusting agents, Example 2 fails to explicitly state that pH adjusting agents were excluded. To the contrary, in the response filed 6/7/2007 (page 2) the applicant disclosed that while Example 1 does not explicitly state that an acid was also added to the pH, an acid was actually added to the slurry prior to adding a base and that both steps 1) adding an acidic adjusting agent and 2) adding a neutral adjusting agent, is necessary to achieve the claimed gamma value. Therefore, the applicant clearly disclosed in the response filed 6/7/2007 that although a pH adjusting agent may not be explicitly mentioned in a specification example it is necessarily present.

In the footnote on page 8 of the appeal brief the applicant asserts that the statement in paragraph 6 of the second declaration (filed 10/4/2007) is "potentially misleading" but that the very next paragraph of said declaration explains how a gamma value of greater than 14 can be obtained without adjusting the pH at all. The examiner respectfully disagrees. Firstly, said disclosure is not "potentially misleading." Said passage is clear and absolute. Said passage clearly discloses that "a gamma value of at least about 14 can only be obtained by performing two steps: (1) adjusting the pH of the slurry first to an acidic pH, and (2) then adjusting the pH to a neutral or alkaline pH." Said passage clearly states that the "only" way to obtain a gamma value of at least 14 is by adjusting the pH. No reasonable interpretation of said passage teaches or suggests that a gamma value of at least 14 can be obtained without adjusting the pH at all. Secondly, said declaration was submitted (see page 2 of the response filed 10/4/2007) for the precise purpose of convincing the examiner that the claimed gamma value can only be obtained by adjusting the pH. Thirdly, the very next paragraph (Example A) of the declaration does not explain how a gamma value of greater than 14 can be obtain without adjusting the pH at all. To the contrary, Example A clearly discloses that sulfuric acid (pH reducing agent) is added to water that has an initial pH of 6.0 and then said sulfuric acid slurry is added to a handset mold to obtain a final pH.

In the footnote on page 8 of the appeal brief the applicant also asserts that the statement in paragraph 7 of the first declaration (filed 3/7/2007) is also "potentially misleading" but that Example 1 of the specification was reproduced in said declaration without performing the pH adjusting steps. The examiner respectfully disagrees. Firstly, said disclosure is not "potentially misleading." Said passage is clear and absolute. Said passage clearly discloses that "The following Example A further proves that a gamma value of at least about 14 can only be obtained by adjusting the pH of the slurry first to an acidic pH, and then to a neutral or alkaline pH." Said passage clearly states that the "only" way to obtain a gamma value of at least 14 is by adjusting the pH. No reasonable interpretation of said passage teaches or suggests that a gamma value of at least 14 can be obtained without adjusting the pH at all. Secondly, said declaration was submitted (see pages 1 and 2 of the response filed 3/7/2007) for the precise purpose of convincing the examiner that the claimed gamma value can only be obtained by adjusting the pH. Thirdly, the applicant suggests that said reproduction of Example 1 without a pH adjusting step resulted in a gamma value of at least 14. To the contrary, said declaration teaches that reproducing Example 1 without a pH adjusting step only results in pH values of less than 14.

In the most recent response (filed 1/3/2011) the applicant submits a fourth declaration (Choi IV Declaration) wherein it is disclosed that statements in the first and second declarations (Choi I and Choi II declarations) are inaccurate. The applicant states, "I now realize that certain statements in the Choi I Declaration and the Choi II Declaration are inaccurate." The applicant also states, "This (fourth) declaration in being provided to correct the inaccurate statements made in the Choi I Declaration and the Choi II Declaration. The inaccurate statements suggest that the only way to obtain a filter media having a gamma value of at least about 14 is to adjust the pH from an acidic pH to an alkali pH...this technique is not the only way to obtain a filter media having a gamma value of at least about 14." The applicant additionally states, "Example 2 in the above-referenced patent application describes embodiments in which a gamma value of greater than 14 was obtained without adjusting the pH from an acidic pH to an alkali pH. In Example 2, gamma values of 16.24 and 16.79 were achieved when a fiber mixture starts out in the hydropulper with a pH of about 9 and then is maintained at a pH of 9 in the headbox. Thus, this example illustrates a process for making filter media having a gamma value of at least about 14 that does not adjust the pH from an acidic pH to an alkali pH."

In conclusion, from the very first response by applicant (filed 8/28/2006) up until the appeal brief (filed 4/28/2009) the applicant asserted that the only way to obtain a filter media having a gamma value of at least about 14 is to adjust the pH from an acidic pH to an alkali pH. But, from the appeal brief (filed 4/28/2009) to the most recent response (filed 1/3/2011) the applicant asserts that this technique is not the only way to obtain a filter media having a gamma value of at least about 14. The applicant has not provided any explanation for why the applicant signed two separate declarations that admittedly make inaccurate statements.

**Claim Rejections - 35 USC § 102/103**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**5. Claims 13-14 and 18-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 4,713,285 to Klein.**

Klein discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the glass wool fibers may have a diameter in the range of 6.5 to 15 microns and that the chopped glass fibers may have a diameter in the range of 0.5 to 3 microns (paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein does not specifically mention gamma values, but Klein does disclose that the dispersion may have a pH as high as 8 (column 8, lines 51-59). Considering that the nonwoven filter media taught by Klein is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Regarding claim 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claim 18, Klein discloses that the each layer may have a fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

Regarding claim 19, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claim 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3).

**Claim Rejections - 35 USC § 103**

**6. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein as applied to claims 13-14 and 18-20 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

Klein does not appear to mention the apparent density of the web, therefore, it would have been obvious to look to the prior art for conventional web densities. Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire

documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein as applied to claims 13-14 and 18-20 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**8. Claims 1-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi (USPN 7,005,112 cited as translation document).**

Klein discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the glass wool fibers may have a diameter in the range of 6.5 to 15 microns and that the chopped glass fibers may have a diameter in the range of 0.5 to 3 microns (page 7, lines 22-24). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein does not specifically mention gamma values, but Klein does disclose that the dispersion may have a pH as high as 8 (column 8, lines 51-59). Considering that the nonwoven filter media taught by Klein is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly

or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Klein appears to be silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez and Takahashi each provide this conventional teaching showing that it is known in the filtration art to use a filter surface area of at least 1.2 $m^2/g$ (see entire documents including column 2, lines 8-21 or Perez and column 8, lines 18-30 of Takahashi). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the surface area at least 1.2 $m^2/g$, motivated by the desire to have strong filtration and by the expectation of successfully practicing the invention of Klein.

Regarding claims 2-3, 9-10 and 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claims 4-6 and 19-20, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claims 6 and 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3).

Regarding claims 7 and 11, Klein discloses that the filter media may be a wet laid filter media (abstract).

Regarding claims 8-12, 16-17 and 31, Klein does not appear to mention the apparent density of the web, but considering that the nonwoven filter media taught by the applied prior art possesses an identical surface area and is made with an identical wet laid process producing a substantially uniform web, it appears that the apparent density of the web is inherently at least about 0.15 g/cc.

Regarding claims 13-17 and 19-20, Klein discloses that the plies may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Regarding claim 18, Klein discloses that the each layer may have a fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

**9. Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

In the event that it is shown that the apparent density of the web is not inherently about 0.15 to 0.21 g/cc, Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging

columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**11. Claims 13-14 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce.**

Klein discloses a nonwoven filter media comprising a layer of glass fibers with a diameter in the range of 0.5 to 15 microns (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses one example wherein the nonwoven may comprises chopped glass fibers and glass wool fibers (paragraph bridging columns 2 and 3), but Klein does not appear to mention specific glass fiber diameter ranges. Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18). Pierce also discloses that it is known in the filter art that glass fiber diameter and weight are result effective variables that affect filtration efficiency (page 10, lines 18-24). Pierce further discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the glass wool fiber and chopped glass fiber diameters and/or weights, because it is understood by one of ordinary skill in the art that the diameters and weights determine filtration efficiency and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Klein does not specifically mention gamma values, but Klein does disclose that the dispersion may have a pH as high as 8 (column 8, lines 51-59). Considering that the nonwoven filter media taught by Klein in view of Pierce is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein in view of Pierce is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Regarding claim 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claim 18, Klein discloses that the each layer may have fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

Regarding claim 19, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claim 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

**12. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce as applied to claims 13-14 and 18-20 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

Klein does not appear to mention the apparent density of the web, therefore, it would have been obvious to look to the prior art for conventional web densities. Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce as applied to claims 13-14 and 18-20 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging

columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**14. Claims 1-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi (USPN 7,005,112 cited as translation document).**

Klein discloses a nonwoven filter media comprising a layer of glass fibers with a diameter in the range of 0.5 to 15 microns (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses one example wherein the nonwoven may comprises chopped glass fibers and glass wool fibers (paragraph bridging columns 2 and 3), but Klein does not appear to mention specific glass fiber diameter ranges. Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18). Pierce also discloses that it is known in the filter art that glass fiber diameter and weight are result effective variables that affect filtration efficiency (page 10, lines 18-24).

Pierce further discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the glass wool fiber and chopped glass fiber diameters and/or weights, because it is understood by one of ordinary skill in the art that the diameters and weights determine filtration efficiency and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Klein does not specifically mention gamma values, but Klein does disclose that the dispersion may have a pH as high as 8 (column 8, lines 51-59). Considering that the nonwoven filter media taught by Klein in view of Pierce is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein in view of Pierce is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Klein appears to be silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez and Takahashi each provide this conventional teaching showing that it is known in the filtration art to use a filter surface area of at least 1.2 $m^2/g$ (see entire documents including column 2, lines 8-21 or Perez and column 8, lines 18-30 of Takahashi). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the surface area at least 1.2 $m^2/g$, motivated by the desire to have strong filtration and by the expectation of successfully practicing the invention of Klein.

Regarding claims 2-3, 9-10 and 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 4-6 and 19-20, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 6 and 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 7 and 11, Klein discloses that the filter media may be a wet laid filter media (abstract).

Regarding claims 8-12, 16-17 and 31, Klein does not appear to mention the apparent density of the web, but considering that the nonwoven filter media taught by the applied prior art possesses an identical surface area and is made with an identical wet laid process producing a substantially uniform web, it appears that the apparent density of the web is inherently at least about 0.15 g/cc.

Regarding claims 13-17 and 19-20, Klein discloses that the plies may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. In addition, as stated above, Pierce discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11).

Regarding claim 18, Klein discloses that the each layer may have a fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

**15. Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

In the event that it is shown that the apparent density of the web is not inherently about 0.15 to 0.21 g/cc, Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**16. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**17. Claims 13-14 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong.**

Klein discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the glass wool fibers may have a diameter in the range of

6.5 to 15 microns and that the chopped glass fibers may have a diameter in the range of 0.5 to 3 microns (paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses that the nonwoven should have a pH of 8 or less (column 8, lines 51-59), but Klein does not appear to mention the addition of multiple charged viscosity modifiers during the wet laid process. Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 7 to about 8.5 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to wet lay the nonwoven as taught by Dong, motivated by a desire to form the nonwoven with a more uniform weight.

Considering that the nonwoven filter media taught by Klein in view of Dong is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein in view of Dong is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Regarding claim 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claim 18, Klein discloses that the each layer may have fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

Regarding claim 19, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claim 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3).

**18. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 18-20 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

Klein does not appear to mention the apparent density of the web, therefore, it would have been obvious to look to the prior art for conventional web densities. Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**19. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 18-20 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**20. Claims 1-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi (USPN 7,005,112 cited as translation document).**

Klein discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the glass wool fibers may have a diameter in the range of 6.5 to 15 microns and that the chopped glass fibers may have a diameter in the range of 0.5 to 3 microns (paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a

wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses that the nonwoven should have a pH of 8 or less (column 8, lines 51-59), but Klein does not appear to mention the addition of multiple charged viscosity modifiers during the wet laid process. Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 7 to about 8.5 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to wet lay the nonwoven as taught by Dong, motivated by a desire to form the nonwoven with a more uniform weight.

Considering that the nonwoven filter media taught by Klein in view of Dong is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by Klein in view of Dong is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Klein appears to be silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez and Takahashi each provide this conventional teaching showing that it is known in the filtration art to use a filter surface area of at least 1.2 $m^2/g$ (see entire documents including column 2, lines 8-21 or Perez and column 8, lines 18-30 of Takahashi). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the surface area at least 1.2 $m^2/g$, motivated by the desire to have strong filtration and by the expectation of successfully practicing the invention of Klein.

Regarding claims 2-3, 9-10 and 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claims 4-6 and 19-20, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claims 6 and 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3).

Regarding claims 7 and 11, Klein discloses that the filter media may be a wet laid filter media (abstract).

Regarding claims 8-12, 16-17 and 31, Klein does not appear to mention the apparent density of the web, but considering that the nonwoven filter media taught by the applied prior art possesses an identical surface area and is made with an identical wet laid process producing a substantially uniform web, it appears that the apparent density of the web is inherently at least about 0.15 g/cc.

Regarding claims 13-17 and 19-20, Klein discloses that the plies may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Regarding claim 18, Klein discloses that the each layer may have a fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

**21. Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

In the event that it is shown that the apparent density of the web is not inherently about 0.15 to 0.21 g/cc, Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**22. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses

that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**23. Claims 13-14 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong.**

Klein discloses a nonwoven filter media comprising a layer of glass fibers with a diameter in the range of 0.5 to 15 microns (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses one example wherein the nonwoven may comprises chopped glass fibers and glass wool fibers (paragraph bridging columns 2 and 3), but Klein does not appear to mention specific glass fiber diameter ranges. Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about

60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18). Pierce also discloses that it is known in the filter art that glass fiber diameter and weight are result effective variables that affect filtration efficiency (page 10, lines 18-24). Pierce further discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the glass wool fiber and chopped glass fiber diameters and/or weights, because it is understood by one of ordinary skill in the art that the diameters and weights determine filtration efficiency and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Klein discloses that the nonwoven should have a pH of 8 or less (column 8, lines 51-59), but Klein does not appear to mention the addition of multiple charged viscosity modifiers during the wet laid process. Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 7 to about 8.5 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to wet lay the nonwoven as taught by Dong, motivated by a desire to form the nonwoven with a more uniform weight.

Considering that the nonwoven filter media taught by the applied prior art is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by the applied prior art is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Regarding claim 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3).

Regarding claim 18, Klein discloses that the each layer may have fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

Regarding claim 19, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3).

Regarding claim 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

**24. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 18-20 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

Klein does not appear to mention the apparent density of the web, therefore, it would have been obvious to look to the prior art for conventional web densities. Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe,

motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**25. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 18-20 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**26. Claims 1-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi (USPN 7,005,112 cited as translation document).**

Klein discloses a nonwoven filter media comprising a layer of glass fibers with a diameter in the range of 0.5 to 15 microns (see entire document including the paragraph bridging columns 2 and 3). Klein discloses that the filter media may be a wet laid filter media (abstract). Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Klein discloses one example wherein the nonwoven may comprises chopped glass fibers and glass wool fibers (paragraph bridging columns 2 and 3), but Klein does not appear to mention specific glass fiber diameter ranges. Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18). Pierce also discloses that it is known in the filter art that glass fiber diameter and weight are result effective variables that affect filtration efficiency (page 10, lines 18-24). Pierce further discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the glass wool fiber and chopped glass fiber diameters and/or

weights, because it is understood by one of ordinary skill in the art that the diameters and weights determine filtration efficiency and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

Klein discloses that the nonwoven should have a pH of 8 or less (column 8, lines 51-59), but Klein does not appear to mention the addition of multiple charged viscosity modifiers during the wet laid process. Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 7 to about 8.5 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to wet lay the nonwoven as taught by Dong, motivated by a desire to form the nonwoven with a more uniform weight.

Considering that the nonwoven filter media taught by the applied prior art is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by the applied prior art is made by a substantially identical wet laid process, it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly

or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Klein appears to be silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez and Takahashi each provide this conventional teaching showing that it is known in the filtration art to use a filter surface area of at least 1.2 $m^2/g$ (see entire documents including column 2, lines 8-21 or Perez and column 8, lines 18-30 of Takahashi). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the surface area at least 1.2 $m^2/g$, motivated by the desire to have strong filtration and by the expectation of successfully practicing the invention of Klein.

Regarding claims 2-3, 9-10 and 14, Klein discloses that the glass wool fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 4-6 and 19-20, Klein discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and

chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 6 and 20, Klein discloses that the chopped glass fibers may be present in an amount of 12 to 15 weight percent and the glass wool fibers may be present in an amount of 46 weight percentage (paragraph bridging columns 2 and 3). In addition, as stated above, Pierce discloses that it is known in the filter art to use glass wool fibers with a diameter of about 0.1 to 5.0 microns in a weight percentage of about 60 to 95% and chopped glass fibers with a diameter of about 5.0 to 9.0 microns in a weight percentage of about 5 to 40% (see entire document including page 7, lines 22-32 and page 6, lines 12-18).

Regarding claims 7 and 11, Klein discloses that the filter media may be a wet laid filter media (abstract).

Regarding claims 8-12, 16-17 and 31, Klein does not appear to mention the apparent density of the web, but considering that the nonwoven filter media taught by the applied prior art possesses an identical surface area and is made with an identical wet laid process producing a substantially uniform web, it appears that the apparent density of the web is inherently at least about 0.15 g/cc.

Regarding claims 13-17 and 19-20, Klein discloses that the plies may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. In addition, as stated above, Pierce discloses that 1 to 10 plies of nonwoven web may be stacked based on the desired weight, filtration efficiency, and level of resistance (paragraph bridging pages 10 and 11).

Regarding claim 18, Klein discloses that the each layer may have a fibers with a diameter of 3 microns (about 4.2 microns) and fibers with a diameter of 0.6 microns (about 0.69 microns). In addition, Klein discloses that the fiber blend may comprise any desired fiber diameter blend (paragraph bridging columns 2 and 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the fiber blend from any suitable combination of fiber diameters, such as claimed, because it is within the general skill of a worker in the art to select known fiber diameter blends on the basis of its suitability and desired characteristics.

**27. Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

In the event that it is shown that the apparent density of the web is not inherently about 0.15 to 0.21 g/cc, Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**28. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,713,285 to Klein in view of WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Klein discloses that sheets of the filter media may be stacked (column 11, lines 26-40). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Klein does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Klein discloses that the glass fibers of each ply may have a diameter in the range of 0.5 to 15 microns (paragraph bridging columns 2 and 3), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**29. Claims 13-14 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong.**

Pierce discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including page 2, lines 23-25). Pierce discloses that the chopped glass fibers may be present in the range of about 5 to 40% by weight

and that the glass wool fibers may be present in the range of about 60 to 95% by weight (page 2, lines 27-29). Pierce discloses that the glass wool fibers may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14). Pierce discloses that the chopped glass fibers may have a diameter in the range of 5.0 to 9.0 microns (page 7, lines 22-24). Pierce discloses that the filter media may be a wet laid filter media (page 14, lines 17-18). Pierce discloses that the number of plies can vary from approximately 1 to 10 plies (page 10, lines 30-31). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

Pierce does not specifically mention gamma values, but Pierce does disclose that a dispersant may be added to the slurry (page 12, line 1 to page 13, 5) and that the resulting slurry may have a pH of about 2.2 to about 3.2 (page 15, lines 7-17). Pierce does not appear to mention raising the pH of the nonwoven glass layer during the wet laid process after the dispersant is added, but Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 5 to about 10 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to raise the pH from a low pH value, as taught by Dong, because the nonwoven filter media would advantageously possess a uniform weight.

Regarding the claimed gamma value, considering that the nonwoven filter media taught by the applied prior art is substantially identical to the claimed nonwoven filter media in

structure and considering that the nonwoven filter media taught by the applied prior art is made by a substantially identical wet laid process (lowering the pH and then raising the pH), it appears that the nonwoven filter media inherently possesses the claimed gamma value.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Regarding claim 14, Pierce discloses that the glass wool fibers of each ply may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14).

Regarding claim 19, Pierce discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (see entire document including page 2, lines 23-25).

Regarding claim 20, Pierce discloses that the chopped glass fibers may be present in the range of about 5 to 40% by weight and the glass wool fibers may be present in the range of about 60 to 95% by weight (page 2, lines 27-29).

**30. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 19-20 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

Pierce does not appear to mention the apparent density of the web, therefore, it would have been obvious to look to the prior art for conventional web densities. Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**31. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 19-20 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Pierce discloses that the number of plies can vary from approximately 1 to 10 plies (page 10, lines 30-31). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Pierce does not appear to mention using a larger fiber diameter in one of the supporting plies, but Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent

plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Pierce discloses that the glass wool fibers of each ply may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**32. Claims 1-17, 19-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi (USPN 7,005,112 cited as translation document).**

Pierce discloses a nonwoven filter media comprising a layer of glass wool fibers combined with chopped glass fibers (see entire document including page 2, lines 23-25). Pierce discloses that the chopped glass fibers may be present in the range of about 5 to 40% by weight and that the glass wool fibers may be present in the range of about 60 to 95% by weight (page 2, lines 27-29). Pierce discloses that the glass wool fibers may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14). Pierce discloses that the chopped glass fibers may have a diameter in the range of 5.0 to 9.0 microns (page 7, lines 22-24). Pierce discloses that the filter media may be a wet laid filter media (page 14, lines 17-18).

Pierce does not mention gamma values, but Pierce does disclose that a dispersant may be added to the slurry (page 12, line 1 to page 13, 5) and that the resulting slurry may have a pH of about 2.2 to about 3.2 (page 15, lines 7-17). Pierce does not appear to mention raising the pH of the nonwoven glass layer during the wet laid process after the dispersant is added, but Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 5 to about 10 (see entire document including column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to raise the pH from a low pH value, as taught by Dong, because the nonwoven filter media would advantageously possess a uniform weight.

Regarding the claimed gamma value, considering that the nonwoven filter media taught by the applied prior art is substantially identical to the claimed nonwoven filter media in structure and considering that the nonwoven filter media taught by the applied prior art is made by a substantially identical wet laid process (lowering the pH and then raising the pH), it appears that the nonwoven filter media inherently possesses the claimed gamma value.

Pierce appears to be silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez and Takahashi each provide this conventional teaching showing that it is known in the filtration art to use a filter surface area of at least 1.2 $m^2/g$ (see entire documents including column 2, lines 8-21 or Perez and column 8, lines 18-30 of Takahashi). Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to make the surface area at least 1.2 $m^2/g$, motivated by the desire to have strong filtration and by the expectation of successfully practicing the invention of Pierce.

Regarding claims 2-3, 9-10 and 14, Pierce discloses that the glass wool fibers of each ply may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14).

Regarding claims 4-6 and 19-20, Pierce discloses that the glass wool fibers may be combined with chopped glass fibers forming a filtration layer (see entire document including page 2, lines 23-25).

Regarding claims 6 and 20, Pierce discloses that the chopped glass fibers may be present in the range of about 5 to 40% by weight and the glass wool fibers may be present in the range of about 60 to 95% by weight (page 2, lines 27-29).

Regarding claims 7 and 11, Pierce discloses that the filter media may be a wet laid filter media (page 14, lines 17-18).

Regarding claims 8-12, 16-17 and 31, Pierce does not appear to mention the apparent density of the web, but considering that the nonwoven filter media taught by the applied prior art possesses an identical surface area and is made with an identical wet laid process producing a substantially uniform web, it appears that the apparent density of the web is inherently at least about 0.15 g/cc.

Regarding claims 13-17 and 19-20, Pierce discloses that the number of plies can vary from approximately 1 to 10 plies (page 10, lines 30-31). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer.

**33. Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-17, 19-20 and 31 above, and further in view of any one of USPN 4,102,785 to Head or USPAP 2003/0005723 to Kawabe.**

In the event that it is shown that the apparent density of the web is not inherently about 0.15 to 0.21 g/cc, Head and Kawabe each provide this conventional teaching showing that it is known in the filter art to use a fiber apparent density of about 0.15 to 0.21 g/cc to obtain excellent mechanical strength (see entire documents including column 4, lines 52-55 of Head and [0116] of Kawabe). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the filter media with a fiber density of 0.15 to 0.21 g/cc, as taught by Head and Kawabe, motivated by the desire to obtain excellent mechanical strength and by the expectation of successfully practicing the invention of Klein.

**34. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of any one of USPN 6,420,024 to Perez or WO 00/48753 to Takahashi as applied to claims 1-17, 19-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.**

Pierce discloses that the number of plies can vary from approximately 1 to 10 plies (page 10, lines 30-31). Therefore, the top ply can be considered to read on the claimed filtration layer and one or more underlying plies can be considered to read on the claimed support layer. Pierce does not appear to mention using a larger fiber diameter in one of the supporting plies, but

Yamaguchi discloses that it is known in the filtration art to vary the fiber diameter of adjacent plies to increase filtration accuracy and increase filtration life (see entire document including column 2, lines 29-44). Yamaguchi discloses that the larger fibers may have a diameter of 1.1 to 20 times as large as the smaller diameter (column 6, lines 38-49). Considering that Pierce discloses that the glass wool fibers of each ply may have a diameter in the range of 0.1 to 5.0 microns (page 6, lines 12-14), it would have been obvious to use fibers with a diameter of 0.69 microns in one ply and fibers with a diameter of 4.2 microns in at least one of the supporting plies, because the filter would possess increased filtration accuracy and increased filtration life.

**Response to Arguments**

35. Applicant's arguments filed 1/3/2011 have been fully considered but they are not persuasive.

Claims 13-14 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong.

The applicant asserts that the third declaration (filed 3/14/2008) demonstrates that the Pierce/Dong combination would never inherently result in a nonwoven with a gamma value of at least 14 because Pierce teaches the use of essentially boron free glass fibers. The examiner respectfully disagrees.

Firstly, Example A of the declaration is clearly irrelevant to the Pierce/Dong rejections because it does not include a pH adjusting agent whereas Dong discloses that it is know in the art to adjust the pH from about 5 to about 10.

Secondly, Example B of the declaration simply discloses that nonwoven filters with gamma values of less than 14 can be constructed with at least one specific combination of low boron glass fibers (23.8% OC Advantex, 4.0% Evanite 804, 28.8% Lauscha A04F, 16% Evanite 806, and 27.4% Lauscha A26F). This result is not unexpected because the current specification already discloses that nonwoven filters with gamma values of less than 14 can be constructed. Therefore, Example B does not teach that boron free glass fibers affect gamma value differently than conventional boron glass fibers or that a gamma value of at least 14 is not obtainable with the low boron glass fibers of Pierce.

Thirdly, Pierce discloses that the nonwoven filter comprises glass wool fibers with a diameter of 0.1 to 5.0 microns in a weight percentage of 60 to 95% and chopped glass fibers with a diameter of 5.0 to 9.0 microns in a weight percentage of 5 to 40%. Although the declaration discloses the weight percentage of each of the five different fiber types, the declaration fails to disclose the diameter of any of the fibers used in Examples A or B. In particular:

1) The declaration fails to disclose the fiber diameter of the OC Advantage fiber.

2) The declaration fails to disclose the fiber diameter of the Evanite 804 fiber.

3) The declaration fails to disclose the fiber diameter of the Lauscha A04F fiber.

4) The declaration fails to disclose the fiber diameter of the Evanite 806 fiber.

5) The declaration fails to disclose the fiber diameter of the Lauscha A26F fiber.

Absent the diameter information it is impossible to know if the applicant even recreated an actual embodiment taught by the applied prior art. In addition, there is no explanation for why Examples A and B include five different fiber types when Pierce makes no such requirement.

Fourthly, the applicant fails to provide an apples-to-apples filter comparison with a filter comprising essentially boron free fibers versus an otherwise identical filter (at least in terms of fiber diameters, fiber lengths, weight percentages, and process steps) comprising borosilicate glass fibers. Absent such an experimental comparison, or absent a convincing reason for why boron free fibers affect the gamma value (so far no reason is given by applicant), the applicant has failed to teach or suggest that the filter taught by the applied prior art fails to inherently possess the claimed gamma value.

Fifthly, the declaration filed 1/3/2011 discloses that multiple declarations by Wai Ming Choi contain inaccurate information. Therefore, it is not clear that the relied upon information in the Wai Ming Choi declarations is accurate.

The nonwoven taught by the applied prior art is substantially identical to the claimed nonwoven in structure (fiber materials, fiber diameters, and fiber weight percentages) and is made by a substantially identical wet laid process (lowering the pH and then raising the pH). In addition, Pierce discloses that one skilled in the art desires a low penetration and low pressure drop (page 10, lines 18-24) and that fiber diameter and filter weight are known result effective variables that affect filtration efficiency (page 10, lines 18-24). Therefore, either the filter inherently possesses the claimed gamma value or it would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the fiber diameters or filter weight to obtain the currently claimed gamma value, because it is understood by one of ordinary skill in the art that fiber diameter and filter weight determine filtration efficiency and because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. **In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).**

The applicant asserts that the examiner provides no valid reason to combine the references. The examiner respectfully disagrees. Pierce discloses that a dispersant may be added to the slurry (page 12, line 1 to page 13, 5) and that the resulting slurry may have a pH of about 2.2 to about 3.2 (page 15, lines 7-17). Pierce does not appear to mention raising the pH of the nonwoven glass layer during the wet laid process after the dispersant is added, but Pierce does disclose that a high tensile strength is desired (page 13, line 21 through page, 14, line 11). Dong discloses that it is known in the wet laid nonwoven glass art to form a glass fiber nonwoven with uniform weight by first contacting the glass fibers with the combination of a charged viscosity modifier and a dispersant followed by the separate addition of an oppositely charged viscosity modifier, resulting in a slurry with a pH in the range of from about 5 to about 10 and a nonwoven web with improved tensile strength, improved tear strength, and uniform weight (see entire document including column 1, lines 50-57, column 2, lines 20-43 and column 6, lines 58-64). It would have been obvious to one having ordinary skill in the art at the time the invention was made to raise the pH from a low pH value, as taught by Dong, because the nonwoven filter media would advantageously possess an improved tensile strength, improved tear strength, and uniform weight.

In response, the applicant asserts that the filaments of Dong are coated with a sizing agent and thus require a viscosity modifier but that the filaments of Pierce do not include a sizing agent and therefore no motivation exists to add a viscosity modifier. The examiner respectfully disagrees. Firstly, Pierce specifically discloses that a viscosity modifier may be added (page 15, lines 18 and 19). Secondly, contrary to applicant's assertion, Pierce clearly discloses that a sizing agent is utilized to make the filaments (paragraph bridging pages 7 and 8).

The applicant asserts that Dong teaches away from increasing the pH because Pierce desires highly dispersed fibers and mats comprising highly dispersed fibers are only produced by limiting the amount of oppositely charged viscosity modifiers. The examiner respectfully disagrees. Dong discloses that highly dispersed fibers may result from limiting the amount of oppositely charged viscosity modified used or by limiting the contact time of the charged and oppositely charged viscosity modifiers prior to removing the water (column 7, lines 26-43).

In response to applicant's argument that Dong is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Dong is in the field of applicant's endeavor which is wet laid methods of making glass fiber mats (see column 1, lines 4-11 of Dong).

The applicant asserts that it is improper to rely on an inherent feature of a combination of references to support an obviousness rejection. The examiner respectfully disagrees. The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 USPQ 431 (CCPA 1977).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 19-20 above, and further in view of USPN 4,102,785 to Head.

The applicant asserts that apparent density and fiber density are not the same because they are allegedly calculated with different measurements. The examiner respectfully disagrees. Firstly, it is well settled that unsupported arguments are no substitute for objective evidence. In re Pearson, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Secondly, the fiber density disclosed by Head is given in grams/cc while the claimed density is also given in grams/cc. Therefore, both refer to the same measure of mass per unit volume.

The applicant asserts that one skilled in the art is incapable of varying the density of a nonwoven material. The examiner respectfully disagrees. Firstly, it is well settled that unsupported arguments are no substitute for objective evidence. In re Pearson, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Secondly, the applicant admits that apparent density depends on basis weight (page 19 of appeal brief) and Pierce specifically discloses that basis weight can be altered by varying the average fiber diameter (page 10, lines 18-30).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong as applied to claims 13-14 and 19-20 above, and further in view of USPN 6,749,753 to Yamaguchi.

The applicant repeats previous arguments.

Claims 1-17, 19-20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of USPN 6,420,024 to Perez.

The applicant asserts that Perez cannot be combined with Pierce because Perez relates to polymeric rectangular cross-section fibers while Pierce allegedly only relates to glass round cross-section fibers. The examiner respectfully disagrees. Firstly, it is well settled that unsupported arguments are no substitute for objective evidence. In re Pearson, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Pierce does not teach or suggest that the invention is strictly related to fibers with a round cross-sectional shape. Secondly, one skilled in the art is clearly capable of constructing polymeric or glass fibers with a rectangular cross-sectional shape.

In response to applicant's argument that Perez is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Pierce and Perez relate to filtration (see title of Pierce and column 2, lines 8-21 of Perez).

The applicant asserts that no motivation exists to combine Pierce and Perez. The examiner respectfully disagrees. Pierce is silent with regards to a specific surface area, therefore, it would have been obvious to look to the prior art for conventional surfaces areas. Perez provides this conventional teaching showing that it is known in the filtration art to use a surface area of greater than 0.25 $m^2/g$, typically about 0.5 to 30 $m^2/g$ and that said surface area is advantageous for filtration applications (see column 2, lines 8-21). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make

the surface area from about 0.5 to 30 $m^2/g$, motivated by a desire to increase filtration ability and by the expectation of successfully practicing the invention of Pierce.

Claims 8-12, 16-17 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of USPN 6,420,024 to Perez as applied to claims 1-17, 19-20 and 31 above, and further in view of USPN 4,102,785 to Head.

The applicant repeats previous arguments.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/43850 to Pierce in view of USPN 6,291,552 to Dong in view of USPN 6,420,024 to Perez as applied to claims 1-17, 19-20 and 31 above, and further in view of USPN 6,749,753 to Yamaguchi.

The applicant repeats previous arguments.

**Conclusion**

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew T Piziali/
Primary Examiner, Art Unit 1798